

# IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of

Osama M. Musa et al.

Serial No.

09/966,453

Group Art Unit:

Filed:

09/28/01

Examiner:

For: ADHESION F
BENZOTRIAZOLES

ADHESION PROMOTERS CONTAINING

# INFORMATION DISCLOSURE STATEMENT PURSUANT TO 37 C.F.R. 1.97

Commissioner for Patents Washington, D. C. 20231

SIR:

In compliance with Applicants' duty of disclosure under 37 C.F.R. 1.56, and in accordance with 37 C.F.R. 1.98, Applicants' direct the Examiner's attention to the publications listed on the PTO #1449 form which is being submitted herewith. Copies of all publications listed on the #1449 form are being submitted herewith.

The disclosure of the above references does not constitute an admission that they are relevant or material to the claims or are "prior art" to the subject application. The citation of them is not to be construed as a representation that no better art exists or that a search has been made; they are cited merely as constituting collectively the closest art of which applicants are aware.

No additional fee is required since this information is filed within 3 months of the filing date.

Respectfully submitted,

Jane E. Gennaro, Reg. No. 34,884

Attorney for Applicant(s)
Tel. 908-685-5205

National Starch and Chemical 10 Finderne Avenue Bridgewater, New Jersey 08807-0500

October 15, 2001

#45036



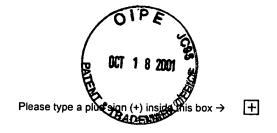
SHEET 1 OF 7

Form PTO-1449 (REV. 7/80)			Atty. Docket No. 1962.EEM				Serial N 09/966,4	-
LIST OF REFERENCES CITED BY APPLICANT (Use several sheets if necessary)								
(800.00	Voici C.	nood it riododdaigy	Applicant:	Osama M. Musa				
			Filing Date				Group	
		U.S. PAT	ENT DOCUM				L	
*Examiner Initial		Document Number	Date	Name	Class	Subclass	Filing I App pria	
	AA	3,493,539	11/13/68	Skouitchi et al	260	47		
	АВ	4,428,987	4/28/82	Bell et al	427	327		
	AC	4,448,847	5/28/82	Bell et al	428	413		
	AD	5,122,858	9/10/90	Mahulikar et al	357	70		
	ΑE	5,449,951	7/1/94	Parthasarathi et	257	677		
	AF	6,225,378 B1	7/1/99	Wang et al	523	454		
	AG							
	АН							
	Al							
	AJ							
	AK							
		FOREIGN PA	ATENT DOCU	JMENTS				
		Document Number	Date	Country	Class	Subclass	Transla- tion	
							Yes	No
	AL	EP 0 251 490 A2 -	27.05.87	Europe	C0 9J	5/02		
	AM	EP 0 285 266 A2	04.03.88	Europe	C0 8J	5/12		
	AN	EP 0 285 266 A3 —	04.03.88	Europe	C0 8J	5/12		
	AO	EP 1 033 590 A2 —	16.02.2000	Europe	G02B	1/04		
	AP							
		OTHER REFERENCES (Including	Author, Title	, Date, Pertinent Pag	es, Etc.)			
	AR							
	AS							
	AT							
EXAMINER			DATE CON	SIDERED		·		
		f reference considered, whether or not cit mance and not considered. Include copy					citation in	f not in



SHEET\_\_2\_ \_OF\_

Form PTO-1449 (REV. 7/80)	Patent and Trademark Office			Atty. Docket No. 1962.EEM				09/966,		
		CES CITED BY APPL neets if necessary)	LICANT							
<b>`</b>				Applicant:	Osama M. Musa					
				Filing Date	e: 09/28/01			Group		
			U.S. PATE	NT DOCUM	ENTS					
*Examiner Initial		Docume	ent Number	Date	Name	Class	Subclass	Filing App pris		
	AA									
	AB							ļ		
	AC									
	AD									
	AE									
	AF									
	AG									
	AH									
·	Al		····							
	AJ									
	AK									
			FOREIGN PA	TENT DOCL	IMENTS					
	1	Docume	ent Number	Date	Country	Class	Subclass	1	Transla- tion	
								Yes	No	
	AL	Hei 11-[1999]-196,	722	07/9/99	Japan					
	AM	Hei 11-[1999]-195,	358 —	07/9/99	Japan					
	AN	Hei 11-[1999]-285,	892	10/06/99	Japan					
	AO	VV M 814/6.76			Germany					
·	AP	DE 44 36 355 A 1			Germany	<u> </u>		<u> </u>		
		OTHER RE	FERENCES (Including	Author, Title	, Date, Pertinent Pag	ges, Etc.)	···			
	AR							<del></del> ,		
	AS		<del></del>			·· –				
	AT		·							
EXAMINER		·		DATE CON	ISIDERED					
			red, whether or not cit sidered. Include copy					citation if	f not in	



PTO/SB/08B (08-00)
Approved for use through 10/31/2002. OMB 0651-0031
U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE
Under the paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

# INFORMATION DISCLOSURE STATEMENT BY APPLICANT (use as many sheets as necessary) Sheet 3 of 7 Application Number 09/966,453 Filing Date 09/28/01 First Named Inventor Osama M. Musa Group Art Unit Examiner Name Attorney Docket Number 1962.EEM

	0	THER PRIOR ART – NON PATENT LITERATURE DOCUMENTS	
Examiner Initials*	Cite No. 1	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item, (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T <sup>2</sup>
		No author: NORBLOC – Polymerizable UV Stabilizers –	
		FOURNIER, T. et al.: "Femtosecond laser studies of excited state	
		intramolecular proton transfer in an ultraviolet – filter molecule"; Chem.	
		Phys. Lett. 2000, 325 (1,2,3), 171-175 (Eng), Elsevier Science B.V.; CA	
		Selects: Siloxanes & Silicones, Issue 23, 2000	1
		HUNEKE, JAMES T. et al.: "Die Attach Adhesion on Leadframes – Treated with Antioxidents"; Oct. 1997 IEEE/CPMT Electronic Packaging Technology ConfSingapore	
		OSTRAUSKAITE, JOLITA et al.: "Synthesis and cationic polymerization of 5-(2,3-epoxypropyl)amino-2-phenyl-1,2,3-benzotriazole"; European Polymer Journal 36 (2000) 2499-2504; Kaunas Univ. of Tech., Kaunas, Lithuania	
		KIM,TAEK HYEON et al.: "Melt Free-Radical Grafting of Hindered Phenol Antioxidant onto Polyethylene"; Journal of Applied Polymer Science, Vol. 77, 2968-2973 (2000); Kwangju, Korea; John Wiley & Sons, Inc. Pub.	-
		KIM, TAEK HYEON et al.: "Free Radicals Grafting of Hindered Phenol Antioxidents Onto Low Molecular Weight PE"; Polymer Preprints 2000, 41(2), 1237; Kwangju, Korea.	-

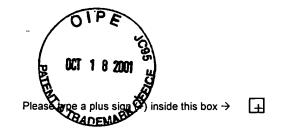
Examiner	Date
Signature	Considered
#4000=	

#43995

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will very depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, Washington, DC 20231.

<sup>\*</sup>EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>&</sup>lt;sup>1</sup> Unique citation designation number. <sup>2</sup> Applicant is to place a check mark here if English language Translation is attached.



1962.EEM

PTO/SB/08B (08-00)
Approved for use through 10/31/2002. OMB 0651-0031
U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE
Under the paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

#### **Application Number** 09/966,453 **Filing Date** 09/28/01 INFORMATION DISCLOSURE **First Named Inventor** Osama M. Musa STATEMENT BY APPLICANT **Group Art Unit Examiner Name** (use as many sheets as necessary) Sheet of\_ **Attorney Docket Number**

	0	THER PRIOR ART – NON PATENT LITERATURE DOCUMENTS
Examiner Initials*	Cite No. 1	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item, (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.
	İ	BARTUS, JAN et al.: "Functional Polymers. 63.* Emulsion
	İ	Copolymerization of Maleimide Type Monomers With Acrylonitrile And
		Styrene In ABS Latexes"; J.M.SPure Appl. Chem., A36(3), pp. 355-371 (1999); 1999 by Marcel Dekker, Inc.
		STOEBER, LUTZ et al.: "Functional Polymers. 64. Potasium
		Ionization Of Desorbed Species (K <sup>+</sup> IDS) Of 2(2-Hydroxyphenyl)2H-
		Benzotriazoles"; J.M.SPure Appl. Chem., A37(11), pp. 1269-1300
		(2000); 2000 by Marcel Dekker, Inc.
		STOEBER, LUTZ et al.: "Functional Polymers 65. Synthesis And Brief
	ŀ	Characterization of Surface Active 2(2-Hydroxyphenyl)2H-
		Benzotriazole Ultraviolet Stabilizers"; J.M.SPure Appl. Chem., A37(9),
		pp. 943-970 (2000); 2000 by Marcel Dekker, Inc.
		NO AUTHOR: Graphs: "A Benzotriazole Family"; "p-
		Polyhydroxystyrene Family"; TriQuest, LP
		ACS Registry Database Structure Search, 54 Entries, 66 Pages.
		KIM, H. et al.: "Corrosion protection and adhesion promotion for
		polyimide/copper system using silane-modified polymeric materials".
		Polymer 41 (2000) 6553-6561, Seoul South Korea
		YU, J. et al.: "Miscibility of Polyimide with Polymeric Primer and Its
		Influence on Adhesion of Polyimide to the Primed Copper Metal: Effect
		of Precursor Origin"; Journal of Polymer Science: Part B: Polymer
		Physics, Vol. 37, 2806-2814 (1999); Pub. John Wiley & Sons, Inc.

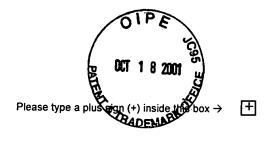
Examiner	Date	***
Signature	Considered	

### #44012

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will very depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, Washington, DC 20231.

<sup>\*</sup>EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>&</sup>lt;sup>1</sup> Unique citation designation number. <sup>2</sup> Applicant is to place a check mark here if English language Translation is attached.



PTO/SB/08B (08-00)
Approved for use through 10/31/2002. OMB 0651-0031
U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE to a collection of information unless it displays a valid OMB control number. Under the paperwork Reduction Act of 1995, no persons are required to respond

#### **Application Number** 09/966,453 INFORMATION DISCLOSURE Filing Date 09/28/01 **First Named Inventor** STATEMENT BY APPLICANT Osama M. Musa **Group Art Unit Examiner Name** (use as many sheets as necessary) Sheet **Attorney Docket Number** 1962.EEM

	0	THER PRIOR ART – NON PATENT LITERATURE DOCUMENTS
Examiner Initials*	Cite No. 1	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item, (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.
		ISHIDA, H. et al.: "Modified Imidazoles: Degradation Inhibitors and Adhesion Promoters for Polyimide Films on Copper Substrates"; J.
		Adhesion, 1991, Vol. 36, pp. 177-191; 1991 Gordon and Breach Science Publishers S.A., U.K.
		PARTHASARATHI, ARVIND et al.: "Leadframe Treatment To Prevent Delamination In Plastic Packages"; Pub. # 14-115; 1994, 1998 Rogers Corporation.
	. <u>.</u> .	DAI, QINPIN et al.: "SERS and IR Studies of Polymerization of an Epoxy Compound on Top of Benzotriazole Adsorbed on Copper"; Spectroscopy Letter, 28(1), 43-54 (1995); Marcel Dekker, Inc. 1995
		XUE, GI et al.: "Stable SERS Substrates Used for In Situ Studies of the Polymer-Metal Interface at Elevated Temperature"; Macromolecules 1994, 27, 809-813; 1994 American Chemical Society.
		POLING, G.W.: "Reflection Infra-Red Studies Of Films Formed By Benzotriazole On Cu*"; Corrosion Science, 1970, Vol. 10, pp. 359 to 370, Pergamon Press, Printed in Great Britain.
		XUE, GI et al.: "SERS, XPS, and Electroanalytical Studies of the Chemisorption of Benzotriazole on a Freshly Etched Surface and and an Oxidized Surface of Copper"; J. Phys. Chem. 1991, 95, 7380-7384.
		YOSHIDA, SHUJI et al.: "A FT-IR Reflection-Absorption Spectroscopic Study of an Epoxy Coating on Imidazole-Treated Copper"; J. Adhesion, 1984, Vol. 16, pp. 217-232; 1984 Gordon & Breach Science Publishers, Inc., U.K.

Examiner	Date	
Signature	Considered	
#44037		

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will very depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, Washington, DC 20231.

<sup>\*</sup>EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>&</sup>lt;sup>1</sup> Unique citation designation number. <sup>2</sup> Applicant is to place a check mark here if English language Translation is attached.



PTO/SB/08B (08-00)
Approved for use through 10/31/2002. OMB 0651-0031
U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

Approved for use through interface. U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCI U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCI Under the paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number

# INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(use as many sheets as necessary)

Sheet	6	of	77

Application Number	09/966,453
Filing Date	09/28/01
First Named Inventor	Osama M. Musa
Group Art Unit	
Examiner Name	
Attorney Docket Number	1962.EEM

	0	THER PRIOR ART - NON PATENT LITERATURE DOCUMENTS	
Examiner Initials*	Cite No. 1	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item, (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T <sup>2</sup>
		MANSFIELD, FLORIAN et al.: Technical Note "Benzotriazole as Corrosion Inhibitor for Copper II. Acid NaC1 Solutions"; Corrosion-Nace, North American Rockwell Science Center, Thousand Oaks, CA;	
		Submitted for publication August, 1972.  VOGT, JURGEN: "Thermoset Matrices for Structural Adhesives: Imidazole-Catalysed Curing of Epoxy Resins"; J. Adhesion, 1987. Vol. 22, pp. 139-151, 1987 Gordon & Breach Science Publishers, Inc., U.K.	
		CHO, KILWON et al.: "Effect of the microstructure of copper oxide on the adhesion behavior of epoxy/copper leadframe joints"; J. Adhesion Sci. Technol, Vol. 14, No. 11, pp. 1333-1353 (2000).	
		LEE, H. Y.: "Failure paths of the Cu-based leadframe/EMC joints"; Materials Science and Engineering A311 (2001) 217-225; 2001 Elsevier Science B.V.	
	-	CHONG, CHAI TAI et al.: "Investigation on the Effect of Copper Leadframe Oxidation on Package Delamination"; 1995 IEEE.	
		HUANG, YIZHE ELISA et al.: "Effect Of Solder Reflow Temperature Profile On Plastic Package Delamination"; 1998 IEEE/CPMT Int'I Electronics Manufacturing Technology Symposium.	
		KANG, TECK-GYU et al.: "Characterization of Oxidized Copper Leadframes and Copper/Epoxy Molding Compound Interface Adhesion in Plastic Package"; 1998 IEEE.	<u></u>

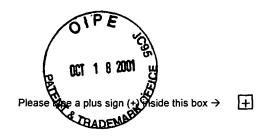
Examiner	Date	
	Date	
Signature	Considered	l
	Outsidered	·

# #44092

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will very depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, Washington, DC 20231.

<sup>\*</sup>EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>&</sup>lt;sup>1</sup> Unique citation designation number. <sup>2</sup> Applicant is to place a check mark here if English language Translation is attached.



PTO/SB/08B (08-00) Approved for use through 10/31/2002. OMB 0551-0031
U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

Under the paperwork Reduction Act of 1995, no persons are required to respond o a collection of information unless it displays a valid OMB control number. **Application Number** 09/966,453

#### **Filing Date** 09/28/01 INFORMATION DISCLOSURE **First Named Inventor** Osama M. Musa STATEMENT BY APPLICANT **Group Art Unit Examiner Name** (use as many sheets as necessary) Attorney Docket Number 1962.EEM

	o	THER PRIOR ART – NON PATENT LITERATURE DOCUMENTS	
Examiner Initials*	Cite No. 1	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item, (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T <sup>2</sup>
		SCHMIDT, R. et al.: "Investigation of the Adhesion Strength between Molding Compound and Leadframe at Higher Temperatures"; 1998 IEEE/CPMT Electronics Packaging Technology Conference. GAILLARD, F. et al.: "Grazing-angle Micro-FTIR Spectroscopy (GAM-	
		FTIR): Applications to Adhesion Studies"; Surf. Interface Anal. 27, 865-870 (1999); John Wiley & Sons, Ltd.	
		ALPERN, P. et al.: "A simple model for the mode I popcorn effect for IC packages"; Microelectronics Reliability 40 (2000) 1503-1508; 2000 Elsevier Science Ltd. All rights reserved.	
		YU, SHAN-PU et al.: "The Adhesion Strength of A Lead-Free Solder Hot-Dipped on Copper Substrate"; Journal of ELECTRONIC — MATERIALS, Vol. 29, No. 2, 2000.	
		H. DEBONTRIDE et al.: "Study of chromating layers on zinc coated steel using FTIR and Raman spectroscopies: application to adhesion properties"; La Revue de Metallurgie-CIT Science et Genie des Materiaux, March 1995.	
			<u> </u>

Examiner	Date	
Signature	Considered	

## #44097

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will very depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, Washington, DC 20231.

<sup>&</sup>lt;sup>1</sup> Unique citation designation number. <sup>2</sup> Applicant is to place a check mark here if English language Translation is